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RANGE CONDITION

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A Classification of the Perennial Grass Forage Type

FISH & GAME

in the Quail Lake Soil Conservation District

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by P.W. Taylor

RANGE CONSERVATIONIST

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QUAIL LAKE SOIL CONSERVATION DISTRICT

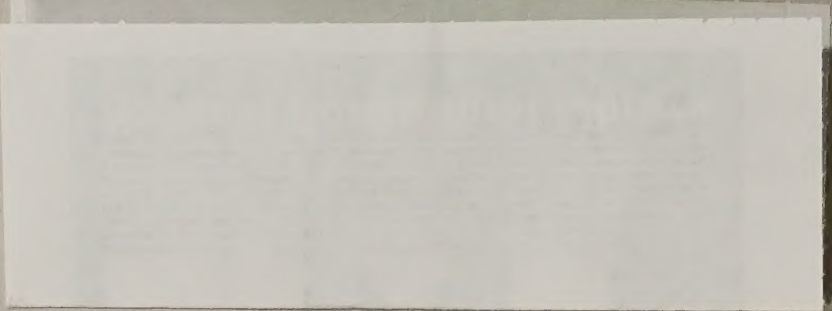
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District Conservationist

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U. S. DEPARTMENT OF AGRICULTURE ★★★★★★ SOIL CONSERVATION SERVICE



This guide contains a score sheet, a list of the more important range plants, and a description of each range condition class for the

- Perennial Grass Forage Type in the Quail Lake Soil Conservation District.

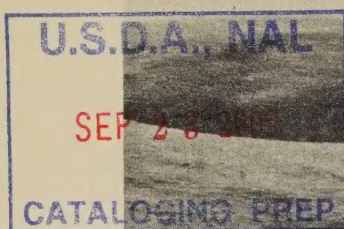
The guide was developed by technicians of the Soil Conservation Service in compliance with the request of the Supervisors of the District for farm and ranch planning assistance in carrying out the district program of soil and water conservation.

The range condition classes described and summarized on the score sheet for the perennial forage type provide the rancher and the planning technician with a ready method of making a range inventory.

Information thus secured portrays the range problems and establishes the basis for designing sound range conservation practices. Applying good range practices in a sustained and systematic manner insures improvement and maintenance of the perennial grass ranges.

R. D. Perry
District Conservationist

THE PERENNIAL GRASS FORAGE TYPE



Typical perennial grass forage in the Quail Lake Soil Conservation District. Range to the left of fence is going down in yield and quality. Range to the right of fence is improving. Here bunchgrasses are getting thicker and showing more vigor.

INTRODUCTION

There are about 15,000 acres of the perennial grass type range in the Quail Lake Soil Conservation District. Larger areas of perennial grass range exist adjacent to the District. The same range type is also found elsewhere in similar areas and elevations of southern California. It is the most important range forage in the area. Within the District, the type occurs at elevations from 3,000 to 5,000 feet. Needlegrasses, squirreltail, creeping wild-rye, blue wild-rye, and pine bluegrass are the key forage plants. They are most abundant on the better condition ranges. A large number of plants of lower value are present on the poorer condition ranges. These lesser value plants are annual brome-grasses, annual fescue popcorn flower, filaree, tarweed, and many others.

The climate of the Quail Lake Soil Conservation District is one of extremes with large seasonal, as well as annual, variations. Average rainfall is 15 inches. It may be scattered over a long period of time, or, some years, it may all fall within a few days. Eighty-five percent of the precipitation occurs from December 1 to April 15. Snow can be expected during any of the rainy months. The summers are dry and hot, with winds blowing from the Mojave Desert. Winter temperatures vary from 10 to 35 degrees. Growth of all plants, especially annuals, is slow from December to March. Forage production may be very good or very poor because of these weather conditions. The greatest changes in the amount of forage occur on ranges that do not have enough residue, and on those ranges where the amount of perennials makes up only a small part of the total forage.

RANGE CONDITION CLASSES

A large number of second-rate, "invader" plants occurs in the perennial grass type. The feed value of most of the "invaders" is similar during their period of green growth. Many of the invading annual plants mature so rapidly that green feed is available for only a short period of three months or less. The perennial grasses have a green feed season of five to six months. Forage yield on perennial grass range may vary from one year to the next as much as 50 percent. The annual ranges may vary as much as 200 percent, from year to year.

The best forage plants grow the most forage per acre. They also furnish the range with the best protection against erosion. They produce the most beef. The good and poor qualities of plants are easily understood when they are listed like this:

The Desirable Forage Plants are:

1. Palatable to livestock.
2. Highly nutritious (feed value).
3. Free from poisons, sharp beards or other bad features.
4. High yielding.
5. Long-lived, with a long season of grazing use.
6. Good protectors and builders of soil.
7. Plentiful on range that has been properly used.

The Undesirable Forage Plants are:

1. Unpalatable to stock.
2. Low in nutrition (feed value).
3. Poisonous or otherwise injurious to animals.
4. Good to graze for only a short season.
5. Short-lived.
6. Low yielding (produce little forage).
7. Plentiful on run-down soils.

There are also plants on the range in this district that are not as good as the best plants, but are better than the poorest plants, because they do have some feed value. These are called the in-between or less desirable plants.

The Less Desirable Plants are:

1. Eaten by livestock only as a second choice.
2. Only moderate soil builders and soil binders.
3. Bad for stock because of awns, beards or other similar features.
4. Shallow-rooted.
5. Short-lived.
6. Annuals and must grow seed each year for next year's crop.
7. High fire hazards after drying.

A list of plants, grouped according to their value for range, is given at the back of this circular to assist you in classifying your grassland range type. Also, there is a score sheet (page 11) that lists the proportion of desirable, less desirable and undesirable plants that are found in each of the condition classes.

The grassland range of the Quail Lake Soil Conservation District is the result of climatic, soils, biotic, and topographic factors which we have here. No change in these factors is known to have occurred within the past several hundred years. Hence, changes in the vegetation are due to man's use of the land. Study shows that livestock management is the most important factor affecting the kind and amount of forage. Management, therefore, determines range condition.

Five range condition classes are found. These are excellent, good, fair, poor, and very poor. Each class shows the present yield and quality of forage on the range. Each of the classes are discussed separately on pages 4 to 8. We found examples of excellent condition range only on small, protected sites. There are ranges in the west end of Antelope Valley that are in good condition. Most of the range in the District rates fair to very poor. Heavy sheet and gully erosion is active on many of the steeper slopes. There is great need for an increase in the amount of residue left on the land at the end of the grazing season. This would quickly reduce soil and water losses and improve range conditions.

JUDGING RANGE TREND

Every rancher making a range inventory wants to know the trend in range condition. Is the range improving or going downhill? Improving ranges point to no change in management. Ranges going downhill need adjustment in one or all of the following: Season of use, number of stock, class of stock, and system of grazing.

In judging range condition, the amount and character of plant residue is of greatest importance. For example, a fair condition range can rapidly become a poor condition range if less than 400 pounds of residue per acre are left at the end of the season. Signs or earmarks that tell whether a range is improving or going downhill are: The vigor of perennial grasses, the amount of erosion, and the kind and amount of organic matter on the surface of the soil.

Turkey mullein and vinegar weed are summer growers. A heavy growth of these plants indicates that the spring forage plants were unable to use the moisture when they were making their growth, because they were grazed too closely. The most critical erosion period is at the time of the first fall rains. Too little residue or too few perennial plants, at this time, allow the soil to wash and the rain to run off the range, even under light rainfall.

EXCELLENT CONDITION



Example: 75% desirable pine bluegrass, squirreltail and blue wild-rye;
25% less desirable red brome and filaree.

Excellent Condition Range: This range is growing a full amount of good forage. The perennial grasses are palatable and nutritious. The season of green, high-quality feed is the longest possible for this area. Plant cover is thick and evenly covers the ground.

Forage Composition: Desirable plants make up 65 to 90 percent; less desirable, 5 to 25 percent; and undesirables, 0 to 15 percent of the total forage volume.

Forage Vigor and Yield: Desirable plants are large and thrifty, and good crops of seed can be produced. During normal years under proper grazing, 600 to 900 pounds of forage per acre are produced, which may be safely grazed. The key forage plants will have about a five-inch stubble height at the end of the grazing season. Total residue left on the land will weigh 400 to 600 pounds.

Erosion: There is no erosion.

Initial Stocking Rate: One to two acres for each cow for one month.

Upward Trend: It is growing as much good forage as it can produce.

Downward Trend: Desirable grasses are closely grazed. There is less residue than there should be. There are no new seedlings. Less desirable and undesirable plants lack vigor, are spindly, yellow in color, and they produce few seeds.

GOOD CONDITION



Example: 45% desirable purple needlegrass and squirreltail; 45% less desirable red brome, downy chess and filaree; 10% undesirable lupine, goldfields and annual fescue.

Good Condition Range: Range that, year after year, is producing 3/4 or more of the forage possible on the site is classed as good. The grazing season is shorter than on excellent condition range because the desirable plants are not as strong as they were.

Forage Composition: Desirable plants make up 45 to 64 percent of the forage volume. Less desirable plants make up 13 to 60 percent, and undesirable plants, 10 to 23 percent of the total forage volume.

Forage Vigor and Yield: Desirable plants are not as strong as they should be. Fair crops of seed are produced. There are 450 to 800 pounds of usable forage produced. From 400 to 700 pounds of residue should be left over winter to aid early recovery of the range.

Erosion: Little, if any, erosion is seen.

Initial Stocking Rate: Stock so as to leave enough stubble and plant residue to cover the ground. Allow $1\frac{1}{2}$ to 3 acres per cow month.

Upward Trend: Key forage grasses are producing good seed crops. There is a good carpet of litter. There are no signs of run-off.

Downward Trend: Key forage plants are growing little or no seed. Less desirable plants are vigorous. There are patches of bare soil.



Example: 20% desirable squirreltail, purple needlegrass and creeping wild-rye; 65% less desirable filaree, red brome and downy chess; 15% undesirable lupine and annual fescue.

Fair Condition Range: Range that is producing 1/2 to 3/4 as much forage as excellent condition range is classed as fair condition.. The growing season is less because the annual plants which have replaced the bunchgrasses mature early. There is a short period of high quality forage early in the season. This good feed is followed by a long period when supplemental feed is required to maintain livestock gains. Careful management will improve this range to good condition within a reasonable period, say 5 to 10 years.

Forage Composition: Desirable plants make up 15 to 44 percent of the forage volume. Less desirable plants make up 30 to 75 percent, and undesirable plants make up 15 to 55 percent of the total forage volume.

Forage Vigor and Yield: The desirable plants are weak, and less desirable plants are reduced in yield. It produces 250 to 550 pounds of usable forage, but if we graze this much, it leaves only 150 to 350 pounds of residue to protect the land. To improve the yield, 400 to 600 pounds of residue should be left on the land.

Erosion: We see slight to moderate wind and water erosion. Soil is reaching a critical stage because of the heavy losses of good topsoil.

Initial Stocking Rate: Stock the range so as to leave more litter and plant residue on the land over winter. Encourage rapid build-up of residue. Allow 2 to 4 acres per cow month.

Upward Trend: There is increased vigor of perennial grasses with seed being produced. A good carpet of residue is forming and there is a decrease in filaree.

Downward Trend: There is little or no seed matured from the small overgrazed perennial grasses. There is not sufficient residue to control erosion. Growth of feed in fall and winter seasons is slow.



Example: 5% desirable pine bluegrass and purple needlegrass; 65% less desirable red brome, filaree and popcorn flower; 30% undesirable turkey mullein, lupine and annual fescue.

Poor Condition Range: Range that is producing 1/4 to 1/2 of the forage it could grow is classed as poor. There are a lot more annuals. There is a large loss of moisture due to run-off. This limits forage growth to 2 or 3 months. The annual grasses will generally be 4 to 7 inches high. The filaree grows only 2 to 4 inches high. To restore these ranges, 10 or more years of good grazing management generally will be required.

Forage Composition: Desirable plants make up 5 to 14 percent of the forage volume. Less desirable plants make up 40 to 70 percent, and undesirable plants make up 25 to 85 percent of the total forage volume. The forage yield varies widely from year to year, depending on climatic conditions.

Forage Vigor and Yield: Plants are weak and low growing. Only 200 to 400 pounds of low quality forage per acre is expected. To improve the range, graze only 100 to 300 pounds of forage, except in the more favorable years. If the range is to improve, 400 to 600 pounds of residue must be accumulated on the land over winter.

Erosion: We see moderate wind or water erosion. Severe losses of topsoil often occur as the early fall rains begin, and before plant growth begins.

Initial Stocking Rate: Defer grazing for one or more years. Build up residue and increase the vigor of desirable plants. Allow 3 to 5 acres per animal-unit-month for only a short period of grazing in late April or early May.

Upward Trend: We see a definite increase in the amount of residue. There is less filaree and summer growing weeds.

Downward Trend: We see little or no residue. There is a thick stand of filaree, but the growth is short.



Example: Only traces of purple needlegrass. 60% less desirable red brome, filaree and annual lotus; 50% undesirable yucca, lupine, tarweed, goldfields and annual fescue.

Very Poor Condition Range: Range that yields less than 1/4 of what it could grow is classed as very poor condition. Ground cover is scarce and short. It is made up mostly of undesirable and less desirable plants. Plant residue is too light to prevent serious run-off. Sheet and gully erosion is active on the slopes with a piling up of soil on flat areas below slopes.

Forage Composition: Desirable plants make up 0 to 5 percent of the forage. Less desirable plants make up 45 to 60 percent and undesirable plants make up 35 to 100 percent of the total forage volume. Composition will vary widely from year to year, depending on the kind of season. Cold seasons appear to cause the "lupine years" and warm, wet seasons, the "filaree years."

Forage Vigor and Yield: Vigor of all plants, except invading brush, is low. Forage varies widely from year to year. During wet years, individual plant growth may give a false idea of the average yield. During average years, total forage yield will be about 250 pounds. This is not enough to prevent erosion or allow range improvement. Plant residue should be accumulated for over-winter protection.

Erosion: There is severe sheet and gully erosion on the slopes. Permanent damage to soil has occurred.

Initial Stocking Rate: Defer until forage production equals more than residue requirements. Residue required to stop erosion varies from 400 to 600 pounds per acre. After grazing commences, generally 5 or more acres per animal-unit-month will be required until the range improves one condition class.

Upward Trend: Erosion scars are healing over. Residue is building up, and vigor of scattered perennials is increasing.

Downward Trend: There is continued erosion with excessive loss of topsoil. The run-off is muddy. Brush and undesirable plants are increasing.

PERENNIAL GRASS FORAGE TYPE

DESIRABLE PLANTS

<u>Common Name</u>	<u>Scientific Name</u>	<u>Symbol</u>
Mountain brome	Bromus carinatus	Bca
Blue wild-rye	Elymus glaucus	Egl
Creeping wild-rye	Elymus triticoides	Etr
Junegrass	Koeleria cristata	Kcr
Melic grass	Melica imperfecta	Mim
Pine bluegrass	Poa scabulla	Psc
Squirreltail	Sitanion hystrix	Shy
Nodding needlegrass	Stipa cernua	Sce
Purple needlegrass	Stipa pulchra	Spu
Desert needlegrass	Stipa speciosa	Ssp
Douglas sedge	Carix douglasii	Cdo
Pinpoint clover	Trifolium gracilentum	Tgr
Tomcat clover	Trifolium tridentatum	Ttr
American vetch	Vicia americana	Vam

LESS DESIRABLE PLANTS

Wild oats	Avena spp.	AVE
Soft chess	Bromus mollis	Bmo
Red brome	Bromus rubens	Bru
Cheatgrass	Bromus tectorum	Bte
Foxtail fescue	Festuca megalura	Fme
Wild onion	Allium spp.	ALL
Balsamroot	Balsamorhiza spp.	BAL
Indian paintbrush	Castilleja spp.	CAS
Morning glory	Convolvus spp.	CON
Filaree	Erodium cicutarium	Eci
Hog-fennel	Lomatium spp.	LOM
Spanish clover	Lotus americanus	LAM
Hill lotus	Lotus humistratus	Lhu
Rock phacelia	Phacelia californica	Pca
Popcorn flower	Plagiobothrys spp.	PLG
Burro-fat	Isomeris arborea	Iar
Deervetch	Lotus scoparius	Lsc
Live oak	Quercus agrifolia	Qag
Valley white oak	Quercus lobata	Qlo

PERENNIAL GRASS FORAGE TYPE

UNDESIRABLE PLANTS

<u>Common Name</u>	<u>Scientific Name</u>	<u>Symbol</u>
Pacific fescue	Festuca pacifica	Fpa
Ripgut brome	Bromus rigidus	Bri
Fiddleneck	Amsinkia spp.	AMS
Milkweed	Asclepias spp.	ASC
Locoweed	Astragalus inflexus	Ain
Locoweed	Astragalus trichopodus	Ati
Goldfields	Baeria spp.	BAE
Brodea	Brodea spp.	BRO
Thistle	Cirsium spp.	CIR
Turkey mullien	Eremocarpus setigerus	Ese
California poppy	Eshscholtzia californica	Eca
Gumweed	Grindelia spp.	GRI
Tarweed	Hemizonia spp.	HEM
Silver lupine	Lupinus adsurgens	Lad
Bicolor lupine	Lupinus bicolor	Lbi
Owls clover	Orthocarpus spp.	ORT
Blue-eyed grass	Sisyrinchium bellum	Sbe
Nightshade	Solanum spp.	SOL
Vinegar weed	Trichostema spp.	TRC
Big sagebrush	Artemesia tridentata	Atr
Rabbitbrush	Chrysothamnus nauseosus	Cna
Shrubby buckwheat	Eriogonum spp.	ERD
Bush lupine	Lupinus albifrons	Lal
Gooseberry	Ribes spp.	RIB
Bush senecio	Scenecio douglasii	Sdo

RANGE CONDITION SCORE SHEET

Forage Type Perennial Grass
 District Quail Lake S. C. D.
 Date June 1947

Factors Evaluated	Excel- lent	Good	Fair	Poor	Very Poor
	%	%	%	%	%
I. Relative Potential Forage Yield	100-90	90-75	75-50	50-25	25-0
II. Important DESIRABLE Forage Plants	90-65	64-45	44-15	14-6	5-0
1. Purple needlegrass					
2. Nodding needlegrass					
3. Squirreltail					
4. Creeping wild-rye					
5. Blue wild-rye					
6. Junegrass					
7. Pine bluegrass					
8. Mountain brome					
9. American vetch					
10. Clovers					
III. LESS DESIRABLE Forage Plants	5-35	15-60	30-75	40-70	10-60
1. Filaree					
2. Popcorn flower					
3. Spanish clover					
4. Hill lotus					
5. Wild oats					
6. Cheatgrass					
7. Red brome					
8. Wall barley					
9. Foxtail fescue					
10. Morning glory					
IV. UNDESIRABLE Forage Plants	0-15	10-23	15-55	25-85	35-90
1. Lupines					
2. Tarweed					
3. Goldfields					
4. Locoweed					
5. Ripgut brome					
6. Pacific fescue					
7. Milkweed					
8. Shrubby buckwheat					
9. Rabbitbrush					
10. Big sagebrush					
V. Plant residue or litter per acre usually associated with condition class	Adequate	Adequate	Moderate to Scarce	Moderate to Inadequate	Inadequate
VI. Erosion usually associated with the condition class.	None	None to Slight	Moderate to Increasing	Moderate to Active	Active to Severe
VII. Acres per A.U.M.	1-2	1½-3	2-4	3-5	5-20
1. Use high stocking rate for north slopes and favorable sites.					
2. Use low stocking rates where filaree totals over 50% of cover.					
3. Use low stocking rate when pine bluegrass is the dominant grass.					

Technician /s/ Peter W. Taylor

A NINE POINT PROGRAM OF LIVESTOCK MANAGEMENT FOR
RANCHES OF THE QUAIL LAKE DISTRICT

1. Stocking: Adjust number of livestock on the range to the amount of feed that may be safely grazed. Use range condition and utilization surveys as guides in making adjustments.
2. Rotation Grazing: Practice a system of deferred-rotation grazing. Range improves quickest when it is not grazed during season of growth.
3. Distribution: Secure uniform utilization of forage by careful location of stock water developments and salt. Avoid salting near water, and change location often enough to prevent killing the vegetation near salt blocks.
4. Utilization Checks: Make utilization inspection each year just before fall rains commence. Adjust livestock management on trend of range condition.
5. Breeding Program: Limit breeding season to 6 or 8 weeks. Breed to produce October and November calves.
6. Marketing: Market saleable stock at end of the green feed period (June to July), unless green supplemental pasture is available. Cull and sell old stock and shy breeders to eliminate "star boarders."
7. Provide adequate supplemental feed for the periods when it is required throughout the year by:
 - a. Building a reserve supply of hay.
 - b. Supplementing dry range feed with cottonseed cake or other concentrate.
 - c. Grazing sudan grass fields in summer.
 - d. Grazing dryland perennial grass pasture.
 - e. Grazing cereal grains in fall and winter.
 - f. Developing irrigated pasture.
8. Class of Livestock: Stock the ranch to about 75 percent of its normal feed supply with breeding cows. Other stock may be yearling steers purchased or produced on the ranch. The number of steers can be adjusted more easily than the number of breeding animals during years of below normal or above normal feed supply. A better quality breeding herd can be developed under this system.
9. Reseeding: Where the improvement of natural forage is too slow, reseed weedy and brushy range and abandoned cultivated lands with good forage grasses.

